

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A method of decomposing a thermosetting resin by a decomposer, comprising the steps of:

only pre-heating the thermosetting resin up to a preheating temperature T0;

kneading the pre-heated thermosetting resin together with a decomposer, and concurrently heating a mixture comprising the thermosetting resin and the decomposer up to a kneading temperature T1, thereby allowing a reaction to take place between the decomposer and the thermosetting resin to obtain a kneaded matter wherein the decomposer becomes consumed; and

heating said kneaded matter to a maximum temperature T2 to decompose the thermosetting resin; wherein:

said pre-heating temperature T0 is not higher than the boiling temperature of said decomposer;

said kneading temperature T1 is not lower than said pre-heating temperature T0 but is lower than the thermal decomposition temperature of the thermosetting resin;

said maximum temperature T2 is lower than the thermal decomposition temperature of the thermosetting resin; and

said pre-heating of the thermosetting resin is performed under the following conditions of temperature T0 and time t:

$$100^{\circ}\text{C} \leq T0 < 260^{\circ}\text{C}$$

$$0.5 \text{ min} \leq t \leq 7 \text{ min,}$$

and wherein when said thermosetting resin is a urethane resin, urethane moieties thereof are decomposed.

Claim 2 (Original): The method according to claim 1, wherein said preheating step is performed under the following conditions of temperature T0 and time t:

$$100^{\circ}\text{C} \leq T0 \leq 230^{\circ}\text{C}$$

$$3.375 \leq 0.0125T0 + t \leq 8.25$$

Claim 3 (Original): The method according to claim 1, wherein said kneading step of thermosetting resins and decomposers is continued, while monitoring the quantity of residual decomposer, until the quantity of residual decomposer is reduced to less than 10%.

Claim 4 (Original): The method according to claim 1, wherein the thermosetting resin and the decomposer are present in the mixture in a ratio of thermosetting resin : decomposer of 2:3 to 1:20, based on weight.

Claim 5 (Original): The method according to claim 4, wherein ratio is 1:5 to 1:7, based on weight.

Claim 6 (Original): The method according to claim 1, wherein a temperature during said kneading step is maintained substantially constant, and the final temperature T1 thereof is substantially identical with the preheating temperature T0.

Claim 7 (Original): The method according to claim 1, wherein the final temperature T1 in said kneading step is higher than the preheating temperature T0.

Claim 8 (Original): The method according to claim 1, wherein said decomposer is enabled to react with and attach to said thermosetting resin during the kneading step, thereby producing an intermediate product.

Claim 9 (Original): The method according to claim 8, wherein the boiling point of said intermediate product to be produced during the kneading step is higher than the boiling point of said decomposer.

Claim 10 (Original): The method according to claim 8, wherein said thermosetting resin comprises a resin having a carbonyl group.

Claim 11 (Original): The method according to claim 10, wherein said resin having a carbonyl group is selected from the group consisting of urethane resin, urea resin and unsaturated polyester, and said intermediate product is produced through attaching of said decomposer to a carbon atom of said carbonyl group.

Claim 12 (Original): The method according to claim 11, wherein said decomposer comprises an amine compound, and said intermediate product is produced through attaching of a nitrogen atom of said amine compound to a carbon atom of said carbonyl group.

Claim 13 (Original): The method according to claim 12, wherein said amine compound is an alkanol amine.

Claim 14 (Original): The method according to claim 13, wherein said alkanol amine is monoethanol amine.

Claim 15 (Original): The method according to claim 13, wherein said alkanol amine is diethanol amine.

Claim 16 (Original): The method according to claim 13, wherein said alkanol amine is triethanol amine.

Claim 17 (Original): The method according to claim 11, wherein said decomposer comprises a compound having a hydroxyl group, and said intermediate product is produced through attaching of an oxygen atom of said hydroxyl group to a carbon atom of said carbonyl group.

Claim 18 (Withdrawn): A decomposition apparatus for decomposing a thermosetting resin by the method claimed in claim 1, wherein said apparatus comprises:

- a chamber for accommodating the thermosetting resin;
- a temperature controllable heating means for heating said chamber;
- a decomposer supply means for feeding a decomposer to said chamber;
- a monitoring means for detecting a quantity of residual decomposer left in said chamber; and
- a temperature control means for controlling said heater on the basis of the quantity of residual decomposer.

Claim 19 (Withdrawn): A control program for controlling heating of a thermosetting resin in a decomposition process of said thermosetting resin, wherein said program comprises the steps of:

instructing a computer to heat a chamber accommodating the thermosetting resin up to a temperature T_0 ;

instructing the computer to determine if said temperature T_0 of said chamber is in the range of 100 to 260°C, and if heating time is in the range of 0.5 min to 7 min;

instructing the computer, when it is determined that said temperature T_0 of said chamber is in the range of 100 to 260°C, and said heating time is in the range of 0.5 min to 7 min, to feed a decomposer to said chamber for a decomposition of the thermosetting resin;

instructing the computer to heat said chamber at a temperature of less than the thermal decomposition temperature of the thermosetting resin;

instructing the computer to detect the quantity of residual decomposer left in said chamber;

instructing the computer to determine if the quantity of residual decomposer is less than 10%;

instructing the computer, when it is determined that the quantity of residual decomposer is not less than 10%, to continue heating of said chamber while keeping the temperature of the thermosetting resin to less than the decomposition temperature of the thermosetting resin; and

instructing the computer, when it is determined that the quantity of residual decomposer is less than 10%, to raise a maximum temperature from a temperature T_1 at this moment up to T_2 , which is higher than T_1 .

Claim 20 (New): The method according to claim 1, wherein during said preheating step, no other operation is performed on or with the thermosetting resin.

DISCUSSION OF THE AMENDMENT

Claim 1 has been amended by deleting “only”, and by making explicit what was at least implicit, i.e., that the term “decompose” as used herein is inconsistent with preservation of, for example, the backbone of a thermosetting resin. Support for the particular language added is found in the specification in any of the reaction schemes for decomposing polyurethanes at pages 9, 11-13 and 15, which show that urethane moieties thereof, i.e., -NHCOO-, are decomposed. Claim 1 is not limited to the thermosetting resin being a urethane resin.

New Claim 20 has been added, which is intended to be of the same scope of Claim 1 prior to the above-discussed amendment, and is supported in the specification at, for example, page 20, lines 20-23, and page 23, lines 9-11. Note that in this disclosure, while not required by the claims, the thermosetting resin is pulverized **prior to** subjecting it to the pre-heating step.

No new matter is believed to have been added by the above amendment. Claims 1-17 and 20 are now active in the application; Claims 18 and 19 stand withdrawn from consideration.